

REMARKS/ARGUMENTS

Applicant has attached as Exhibits A-H a number of research papers he has authored.

The Examiner had a number of rejections under 35 U.S.C. §112. Applicant hereby addresses these issues.

1. Examiner states that claims 1-25:

...recite 1,4,5,8-tetrasubstituted anthraquinones of formula 1. However, the present specification does not convey to the skilled artisan in the art that applicant, at the time the application was filed, had possession of said compounds because it discloses bis-substituted and not tetra-substituted anthraquinone derivatives as encompassed by the instant claims.

Applicant replies that actually, the formula 1 is a general formula, it shows that four different positions can be substituted, but all of the inventor's compounds are bis-substituted, either 1,5-disubstituted, 1,4-disubstituted or 1,8-disubstituted.

2. The Examiner states that:

[w]ith regards to claims 13-18, the present specification fails to provide sufficient descriptive information, such as correlation of the various effects such as inhibition of cellular growth, enhancement of lipid peroxidation etc. and treatment of a representative number of diseases and, thus, it lacks adequate description of the presently claimed invention. In other words, the present specification does not reasonably convey to the skilled artisan in the art that at the time of the present application, applicant had possession of the claimed invention. Adequate written description requires more than a mere indication that the claimed compound(s) have certain effect(s). Some correlation between said effect(s) and treatment of a representative number of diseases is required.

Applicant answers that in his research papers (Exhibits A-H) he indicated all biological evaluation in vitro, various cell lines and lipid peroxidation. The most detailed results

were shown in his publications in order to summarize all of the compounds. These compounds still belong to novel derivatives. It is impossible to predict their side effects and their application for diseases. Thus, he just shows the results of biological evaluation. From this, the skilled artisan in pharmaceutical chemists can claim they have these potential activities. Therefore, the specification does reasonably convey to the skilled artisan in the art that at the time of the present application, applicant had possession of the claimed invention.

3. The Examiner further argues that claims 13-18 contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Namely:

- a. *The instant claims are drawn to treatment of cancers, treatment of abnormal proliferation, enhancing anti-oxidation effect, enhancing human telomerase activity, stem cell research or enhancing tissue-engineering application by administering the claimed compound(s). The instant claims lack recitation of specific diseases and, thus, read on all diseases, known and unknown, that might be treatable utilizing the claimed anthraquinone derivatives.*
- b. *The present specification discloses different effects of the claimed compound(s) such as cytotoxicity, effect on lipid peroxidation, telomerase activity etc. However, there is no showing that said effects would result in treatment of any disease and, thus, there is insufficient guidance for the skilled artisan to be able to utilize the claimed compounds in the treatment of the scope of diseases encompassed by the instant claims. The amount of experimentation necessary to practice the claimed invention commensurate in scope with the instant claims would not be routine because the skilled artisan would have to first determine the effect of oxidation, telomerase activity etc. in the development of each disease, known and unknown, before determining the effect of the claimed compounds on the treatment of said diseases. Said determination would result in undue experimentation.*

Applicant answers that for the skilled artisan, the novel compounds can be candidate for antitumor drugs and they should have potential cytotoxicity, antioxidant activity, telomerase activity or other biological activity and so on.

4. The Examiner argues that claims 1-25:

...fail to correspond in scope with that which applicant(s) regard as the invention can be found in the specification filed July 8, 2003. In the originally filed specification, applicant has stated that the claimed compounds are bis-substituted anthraquinone derivatives, and this statement indicates that the invention is different from what is defined in the claim(s) because the compounds encompassed by the instant claims are tetra-substituted and not bis-substituted anthraquinone derivatives.

The Applicant argues that tetra-substituted anthraquinones are not disclosed. If the Examiner would like the Applicant to modify the representation of Formula I, Applicant will gladly do so.

5. The Examiner argues that claims 1-9 and 13-18 are indefinite for the following reasons:

(a) *Claim 1, identifies but does not define "n";*

The application (see the Abstract) clearly defines $-(CH_2)OH$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2)_4OH$. However, $-(CH_2)_5OH$, $-(CH_2)_6OH$ are not specifically defined therein although they are the extension from the artisan technique. Claim 1 has been amended to identify " $-(CH_2)OH$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2)_4OH$."

Claim 1 contained a typographical error in that $-(CH_2)_nNH$ was identified, whereas $-(CH_2)_nNH_2$ should have been identified instead. The application (see the Abstract) clearly defines $-(CH_2)NH_2$, $-(CH_2)_2NH_2$, $-(CH_2)_3NH_2$, $-(CH_2)_4NH_2$, $-(CH_2)_5NH_2$. Claim 1 has been amended to identify " $-(CH_2)NH_2$, $-(CH_2)_2NH_2$, $-(CH_2)_3NH_2$, $-(CH_2)_4NH_2$, $-(CH_2)_5NH_2$."

Such changes add no new matter.

- (b) *Claim 1 recites two sets of definition for R1-R4. Does applicant intend the combination of the groups defined by said definitions or the utilization of one or the other definition?*

Applicant answers that Applicant intends the combination of the groups defined by the definitions.

- (c) *Claim 1 recites various incomplete groups. For example, (i) $-(CH_2)_nNH$ (nitrogen has two instead of three attachments) or (ii) $-S-$, $-O-CO-$, $-N-$ etc. These groups do not define a complete substituent and, thus, it is unclear what is intended.*

Applicant answers that these groups do define a complete substituent and, thus, it is clear what he intended.

- (d) *Claims 2 and 3 recite groups, for example, ethylphenyl, 2-OH-C₆H₄, CH₂Br(C1) and CH₂OH not encompassed by parent claim 1.*

Applicant answers that claim 1 recites groups for long chain and alkyl substitutions, whereas claim 2 recites groups for aromatic and heterocyclic substitutions.

- (e) *Claims 13-18 recite various methods comprising administering the claimed compound(s) to a patient in need of "such" treatment. However, the instant claims lack identification of disease(s) that said patient has that would require the administration of the claimed compound(s). Therefore, the metes and bound of the claimed invention is indefinite.*

Applicant answers that claims 13-18 recite various methods comprising administering the claimed compound(s) to a patient in need of "such" treatment. As a skilled artisan, the biological evaluation mention for cytotoxicity, lipid peroxidation, telomerase activity, and other assays can be predicted as these compounds have potential applications for these diseases.

6. The Examiner argues that claims 4-9 and 19-25 are objected to under 37 C.F.R. 1.75 as being a substantial duplicate of claims 1 and 11, respectively. Applicant notes that claims 4-9, and 19-25 have been cancelled. Applicant has also cancelled claim 12.

Claim Rejections - 35 U.S.C. § 102

I. Allen et al.

7. The Examiner rejected claims 1, 4-9, 11 and 19-25 under 35 U.S.C. 102(b) as being anticipated by Allen et al. (U.S. Pat. No. 2,611,772). The Examiner argues that "Allen et al. teaches 1,4,5,8-tetraamino-anthraquinones such as 1,4,5,8-tetrahydroxyethylaminoanthraquinone (see the entire article, especially col. 2, line 25-26)" and that "the compounds taught by the reference are encompassed by the instant claims." Claims 4-9 and 19-25 have been cancelled.

8. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d. 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 828 F.2d 1226,1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). MPEP § 2131.

9. Allen et al. teaches 1,4,5,8-tetraamino-anthraquinones such as 1,4,5,8-tetrahydroxyethylamino-anthraquinone.

10. Applicant does not show tetrasubstituted anthraquinones in the claims.

11. Thus, Allen does not anticipate the present invention in claims 1 or 11, or any of the claims that depend therefrom because each and every element as set forth in said claims are not found in claims 1 or 11.

II. Patterson et al.

12. The Examiner rejected claim 12 under 35 U.S.C. 102(b) as being anticipated by Patterson (U.S. Pat. No. 5,132,327), arguing that Patterson et al. teaches the production of bis-substituted anthraquinones by reacting the corresponding 1,5-

dichloroanthraquinone or 1,8-dichloroanthraquinone with an amine (see the entire article, especially Examples 1(1) and 4(1)).

13. Applicant disagrees. Patterson et al. teaches the production of bis-substituted anthraquinones by reacting the corresponding 1,5-dichloroanthraquinone or 1,8-dichloroanthraquinone with an amine. However, the present invention's synthetic methods are different. The end products were not the same. The inventor has checked the examples given by Patterson et al. but did not find the same example. The present invention uses a different synthetic method to approach the target.

14. However, to facilitate a speedy prosecution, Applicant has cancelled claim 12.

Conclusion

If the Examiner feels it would advance the application to allowance or final rejection, the Examiner is invited to telephone the undersigned at the number given below.

Reconsideration and allowance of the application as amended is respectfully requested.

DATED this 21st day of February 2006.

Very respectfully,



Stephen M. Nipper
Reg. No. 46,260
(208) 345-1122



Examiner Badio
Serial # 10/615,695

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I HEREBY CERTIFY that this correspondence is being deposited with the United States Postal Service on the below date as first class mail in an envelope addressed to:

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Amber R. Smith
Amber R. Smith